

# Agilent HLMP-FWxx 5mm Extra Bright Flat Top InGaN White LED Lamps. Data Sheet

**HLMP-FW66, HLMP-FW67**

## Description

These high intensity white LED lamps are based on InGaN material technology. A blue LED die is coated by phosphor to produce white. The typical resulting color is described by the coordinates  $x = 0.31$ ,  $y = 0.31$  using the 1931 CIE Chromaticity Diagram.

These flat top lamps are untinted, non-diffused, and incorporate precise optics which produce well-defined spatial radiation patterns at specific viewing cone angle.

## Features

- High luminous white emission
- Flat top
- Standoff or non-standoff leads
- Superior resistance to moisture

## Applications

- Electronic signs and signals
- Small area illumination
- Legend backlighting
- General purpose indicators

## Benefit

- Reduced power consumption, higher reliability, and increased optical/mechanical design flexibility compared to incandescent bulbs and other alternative white light sources.

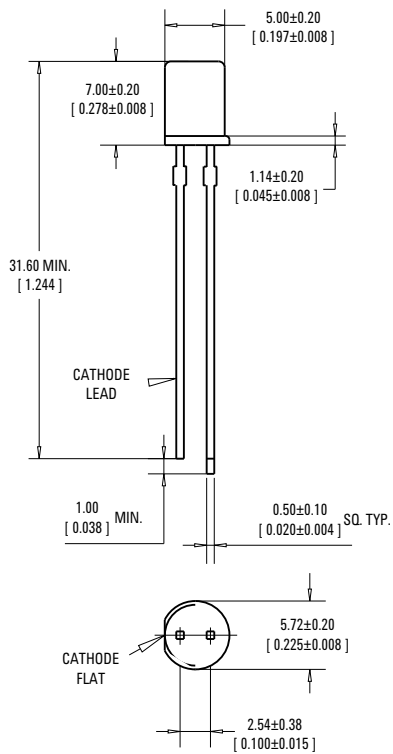
*Caution: Devices are Class 1 ESD sensitive. Please observe appropriate precautions during handling and processing. Refer to Application Note AN-1142 for additional details.*



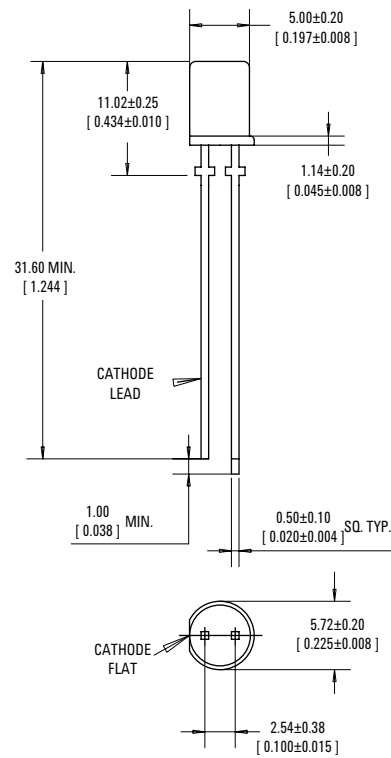
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## Package Dimensions

### Package Dimension A



### Package Dimension B



#### Notes:

1. All dimensions are in millimeters / inches.
2. Epoxy meniscus may extend about 1mm (0.040") down the leads.
3. If heat-sinking application is required, the terminal for heat sink is anode.

## Part Numbering System

H L M P - F W XX - X X X XX

#### Mechanical Option

- 00: Bulk
- DD: Ammo Pack Straight Leads

#### Color Bin Options

- 0: Full color bin distribution
- B: Color bin 2 & 3 only

#### Maximum Intensity Bin

- 0: No maximum intensity bin limit
- Others: Refer to Device Selection Guide

#### Minimum Intensity Bin

- Refer to Device Selection Guide

#### Viewing Angle and Standoff Option

- 66: Flat top without standoff
- 67: Flat top with standoff

## Device Selection Guide

Part Number	Typical Viewing Angle, 2 $\theta$ <sub>1/2</sub> (Degree)	Intensity (mcd) at 20 MA		Standoff	Package Dimension
		Min.	Max.		
HLMP-FW66-LP0xx	85	400	1150	No	A
HLMP-FW66-MN0xx	85	520	880	No	A
HLMP-FW66-MNBxx	85	520	880	No	A
<b>HLMP-FW66-MQ0xx</b>	<b>85</b>	<b>520</b>	<b>1500</b>	<b>No</b>	<b>A</b>
<b>HLMP-FW66-NP0xx</b>	<b>85</b>	<b>680</b>	<b>1150</b>	<b>No</b>	<b>A</b>
<b>HLMP-FW66-NPBxx</b>	<b>85</b>	<b>680</b>	<b>1150</b>	<b>No</b>	<b>A</b>
HLMP-FW67-LP0xx	85	400	1150	Yes	B
HLMP-FW67-MN0xx	85	520	880	Yes	B
HLMP-FW67-MNBxx	85	520	880	Yes	B
<b>HLMP-FW67-MQ0xx</b>	<b>85</b>	<b>520</b>	<b>1500</b>	<b>Yes</b>	<b>B</b>
<b>HLMP-FW67-NP0xx</b>	<b>85</b>	<b>680</b>	<b>1150</b>	<b>Yes</b>	<b>B</b>
<b>HLMP-FW67-NPBxx</b>	<b>85</b>	<b>680</b>	<b>1150</b>	<b>Yes</b>	<b>B</b>

### Notes:

1. Tolerance for luminous intensity measurement is  $\pm 15\%$
2. The luminous intensity is measured on the mechanical axis of the lamp package.
3. The optical axis is closely aligned with the package mechanical axis.
4. 2 $\theta$ <sub>1/2</sub> is the off-axis angle where the luminous intensity is  $\frac{1}{2}$  the on axis intensity.
5. Part numbers in **BOLD** are recommended for new designs.

## Absolute Maximum Rating at T<sub>A</sub> = 25°C

Parameters	Value	Unit
DC forward current <sup>[1]</sup>	30	mA
Peak pulsed forward current <sup>[2]</sup>	100	mA
Power dissipation	105	mW
LED junction temperature	110	°C
Operating temperature range	-40 to +85	°C
Storage temperature range	-40 to +100	°C
Wave soldering temperature <sup>[3]</sup>	250 for 3 seconds	°C
Solder dipping temperature <sup>[3]</sup>	260 for 5 seconds	°C

### Notes:

1. Derate linearly as shown in figure 2.
2. Duty factor 10%, frequency 1KHz
3. 1.59 mm (0.060 inch) below body

**Electrical/Optical Characteristics  $T_A = 25^\circ\text{C}$**

Parameters	Symbol	Min	Typ	Max	Units	Test Condition
Forward voltage	$V_F$		3.2	4.0	V	$I_F = 20 \text{ mA}$
Reverse Voltage <sup>[1]</sup>	$V_R$	5.0			V	$I_R = 10 \mu\text{A}$
Thermal resistance	$R\theta_{J-PIN}$		240		$^\circ\text{C}/\text{W}$	LED Junction to anode lead
Chromaticity Coordinates <sup>[2]</sup>	X Y		0.31 0.31			$I_F = 20 \text{ mA}$
Capacitance	C		70			$V_F=0, f=1\text{MHz}$

Notes:

1. The reverse voltage of the product is equivalent to the forward voltage of the protective chip at  $I_R = 10 \mu\text{A}$
2. The chromaticity coordinates are derived from the CIE 1931 Chromaticity Diagram and represent the perceived color of the device.

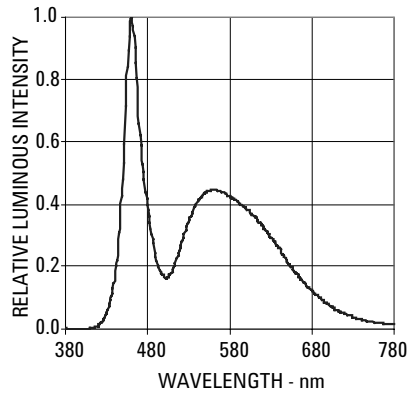


Figure 1. Relative Intensity vs. Wavelength

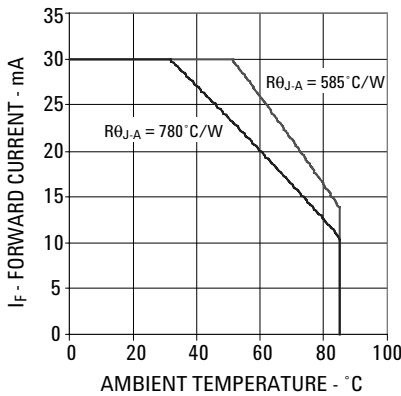


Figure 2. Forward Current vs. Ambient Temperature.

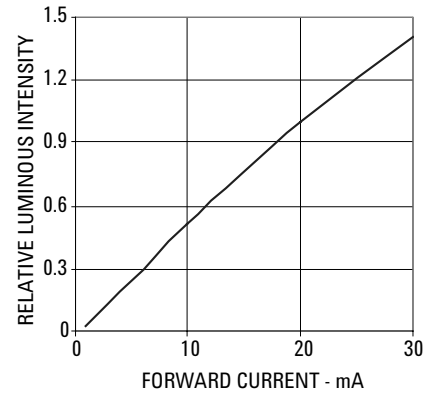


Figure 3. Relative Intensity versus DC Forward Current

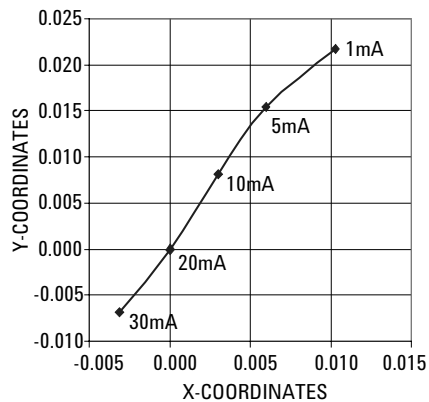


Figure 4. Chromaticity shift vs. Current

\*Note: (x,y) values @ 20mA reference to (0,0)

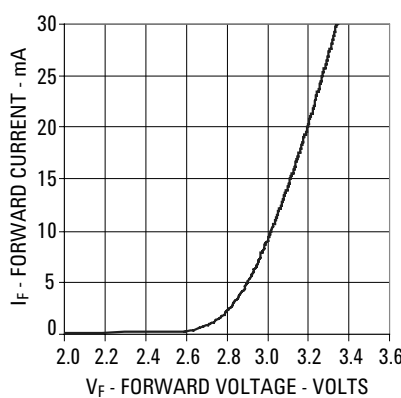


Figure 5. Forward Current vs. Forward Voltage.

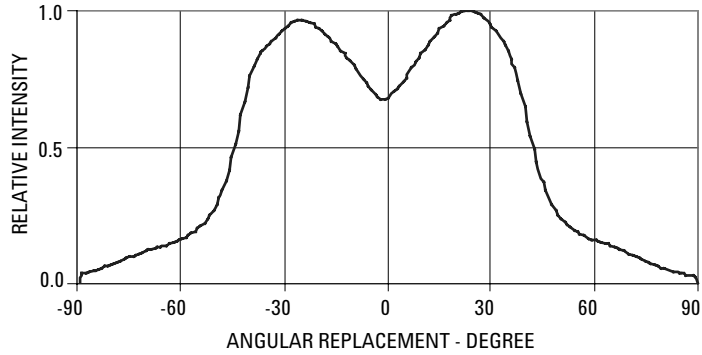


Figure 6. Spatial Radiation Pattern

### Intensity Bin Limit Table

Bin	Intensity (mcd) at 20 mA	
	Min	Max
L	400	520
M	520	680
N	680	880
P	880	1150
Q	1150	1500

Tolerance for each bin limit is  $\pm 15\%$

### Color Bin Limit Table

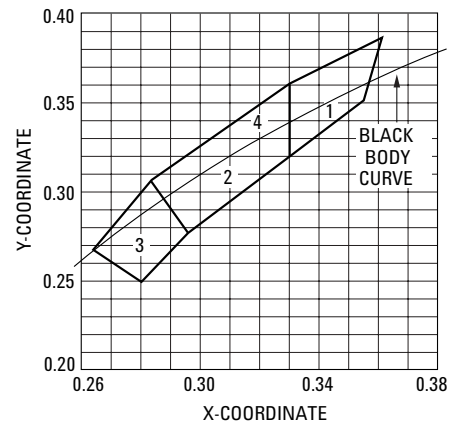
Rank	Limits (Chromaticity Coordinates)				
1	X	0.330	0.330	0.356	0.361
	Y	0.360	0.318	0.351	0.385
2	X	0.287	0.296	0.330	0.330
	Y	0.295	0.276	0.318	0.339
3	X	0.264	0.280	0.296	0.283
	Y	0.267	0.248	0.276	0.305
4	X	0.283	0.287	0.330	0.330
	Y	0.305	0.295	0.339	0.360

Tolerance for each bin limit is  $\pm 0.01$

Note:

- Bin categories are established for classification of products. Products may not be available in all bin categories. Please contact your Agilent representative for information on currently available bins.

### Color Bin Limits with Respect to CIE 1931 Chromaticity Diagram



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Data subject to change.

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